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ABSTRACT

Project PRIME (Planning Resources in Minnesota Education) was a 1-year research project that had as its prime objective the test implementation of the CAMPUS model for higher education administration and planning in Minnesota. This report outline the 13 specific objectives of the project and describes the research results. In addition, the report: (1) serves as a guide to more detailed reports available from the project; (2) summarizes conclusions concerning the CAMPUS model and its applicability to Minnesota higher education in terms of the computer program, the conceptual model, the availability of data, and the value of a simulation model; and (3) presents recommendations for continued development of a planning, programming, and budgeting system for the State's higher education system, and on the responsibility of the participating institutions, and a proposed budget. The enclosures include: (1) an annotated bibliography of Project PRIME reports; (2) summaries of 2 related studies; (3) program costing report; (4) an agenda for selected presentations; and (5) a report of expenditures by source of funds. (AF)

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Project PRIME Report No. 16

Final Report: Project PRIME

For Period July 1, 1970 - June 30, 1971

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October 1971

Project PRIME Research Coordinated by the
Minnesota Higher Education Coordinating Commission
in cooperation with
Lakewood State Junior College and the Minnesota State Junior College Board
Bemidji State College and the Minnesota State College Board
School of Business Administration and the University of Minnesota

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(Test Implementation of CAMPUS)

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Final Report - Project PRIME

This report has four goals:

(1) To describe the research results of a one-year project.

(2) To serve as an introduction to the more detailed reports available from the project.

(3) To summarize conclusions concerning the CAMPUS model and its applicability to Minnesota higher education.

(4) To present the outlines of a plan for continued development of a planning, programming, and budgeting system for the Minnesota higher education system.

1.0 BACKGROUND

Project PRIME (Planning Resources in Minnesota Education) was a one-year research project jointly funded by the Minnesota State College System, the Minnesota Junior College System, the University of Minnesota, the State of Minnesota, and the Hill Family Foundation. The research was coordinated by the Minnesota Higher Education Coordinating Commission. Initial approval for the project's funding was based on a March 1970 report entitled "Test Implementation of CAMPUS for Higher Education Administration and Planning in Minnesota."* This report outlined six major objectives of the project, an implementation schedule, responsibility of participating institutions, and a proposed budget. Project PRIME Report No. 14 described the progress on these six objectives through December 30, 1970, and indicated four additional goals which had arisen since the original proposal.

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*Available as Project PRIME Report No. 1. Enclosure A is an Annotated Bibliography of the 16 PRIME Reports. Project PRIME Report No. 8 describes the CAMPUS simulation model in detail.

2.0 PROJECT OBJECTIVES AND RESULTS

Project PRIME'S initial objectives are discussed below. In order to facilitate description, the original six objectives were expanded to nine (plus the four additional yielded 13 objectives). The project's 13 objectives included:

(1) Converting the CAMPUS model from an IBM 360/85 to the University of Minnesota's CDC 6600.

(2) Developing a program structure and a basic set of data at each of three institutions (The Division of Behavioral Science, Bemidji State College; The School of Business Administration - University of Minnesota; and Lakewood State Junior College).

(3) Training the participants on use of the model.

(4) Conducting a test simulation of each institution.

(5) Documenting the results of the test implementation at each institution.

(6) Designing compatible planning tools.

(7) Researching program analysis and faculty activities.

(8) Studying the problems of linking CAMPUS to institutional information systems.

(9) Highlighting problem areas requiring further research.

As reported in the mid-term progress report, the project team felt that several additional objectives were desirable and feasible, including:

(10) Writing a detail input documentation manual.

(11) Adding two academic organizations - The Division of Educational Psychology - University of Minnesota; and Hopkins School District. (Since the mid-term progress report, Rochester State Junior College was also added.)

(12) Improving the model.

(13) Converting the model to do program costing.

2.1 Model Conversion

The model has been successfully converted to the University of Minnesota Control Data Corporation's 6600 computer. To the best of our knowledge, no other institution in the United States has the model operating with actual institutional data.

2.2 Program Structure And Data Collection

Each of the five institutions has a basic data deck describing its present operations. The state junior colleges are unhappy about their program structure; however, they are instituting changes to correct the situation.

2.3 Test Runs

One year simulation runs were made at Lakewood State Junior College, Rochester State Junior College, The Educational Psychology Division, University of Minnesota, and Hopkins School District. The simulation runs at the School of Business Administration were more extensive and best represent the model's capability. Basically three questions were addressed:

(1) An admissions question - what is the resource impact of the following variation in projected student flow?

  (a) 0% growth in graduate and undergraduate programs.
  (b) 4% growth in only graduate programs.
  (c) 4% growth in both graduate and undergraduate programs.

(2) A curriculum question - what is the resource impact of adopting one master's level degree (as opposed to the present three)?

(3) An organizational question - what is the resource impact of significantly modifying the administrative structure of the school from six academic departments and three research centers to four academic-research departments?

Simulation runs to address the latter two questions were run at 0% and 4% year student growth. Each simulation was run for ten years. Project PRIME Report No. 10 describes the results of these experiments. Also, Project PRIME Report No. 9 describes several other experiments run at the School of Business Administration, including: (1) A phase-out of the undergraduate program, and (2) A change of entrance requirements. Similar multi-year experiments were run at Bemidji State College and are described in Project PRIME Report No. 15.

2.4 Test Implementation Documentation

Project PRIME Report No. 15 is a case study of the five test implementations, written by a participant at each institution. A brief description of each institution and the participating personnel are included below:

State College System: Initially the plan was to do only the Behavioral Science Division of Bemidji State College, because of model restraints and the amount of data collection involved. During the last few months of the project, the total school was put on the model. This was accomplished by aggregating courses, e.g., lower division English, upper division music, etc. Key personnel at Bemidji State College include the President - who became quite interested, the head of the Behavioral Science department, and three people from the Institutional Research department.

Junior College System: Initially the plan was to do only Lakewood State Junior College, however, after seeing the initial results, Rochester State Junior College was added. Plans are in progress to collect data for all 18 state junior colleges. Key participants in this implementation were the President of Lakewood State Junior College, the Assistant Chancellor for Information Systems, and the Chancellor of the Junior College System.

School of Business Administration (SBA), University of Minnesota: The initial data collection for the SBA was done by the project team. Since the Business School is both a graduate and an undergraduate institution, it was the most complete utilization of the model's capability. In conjunction with personnel from the Long Range Planning Committee, 12 ten-year experiments were conducted, with various alternative assumptions about the administrative structure, degree offerings, and student flow. A planning "calendar" was proposed compatible with the present University budgeting cycle.*

Division of Educational Psychology (EP), University of Minnesota: The EP implementation was not included in the original proposal, but was attempted at the urging of the division head. He had the assistance of two graduate students, plus support from a professor on sabbatical leave. The latter professor was on leave to conduct a detailed review of the College of Education's curriculum (of which EP is a division). Plans are being laid to add the Educational Administration Division. Although EP did not conduct any experiments, considerable time was spent analyzing the significance and the impact of key input parameters.

Hopkins School District: Although not included in the original proposal, project personnel worked with the Hopkins School District. After determining that the model would simulate a complete school district, a three-year simulation was run on one high school. At this time, the data has not been used by the district's personnel, but they have expressed interest in continued experimentation with the model.

2.5 Training

The project proposal indicated that training would be offered at three levels: (1) top administrative - for appreciation and interpretation of the model and its results; (2) second level administrative - for updating the structural aspects of the model; and (3) data analyst - for procedures on updating and maintaining the detailed data needed by the model. The training would involve a thorough understanding of: (1) the concepts of planning, programming and budgeting systems (PPBS); and (2) the operational aspects of the CAMPUS model.

The following items contributed to accomplishing these training goals:

(1) Most of the institutional personnel associated with the project, including the Presidents of Bemidji State College and Lakewood State Junior College, and the Dean of the Business School, attended a two-day "WICHE Management Information Systems Program Training Seminar."

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*See Project PRIME Report No. 10 for additional details.

(2) Two initial orientation seminars were held at Bemidji State College and one at the Business School (with the faculty).

(3) Approximately 15 to 20 training sessions of from one to four hours each were held with the four institutions to discuss program structuring and data collection. (Recall that data collection at the Business School was conducted by the project team.)

(4) Presentations on the project's activities were made to the project's Advisory Committee, the State College System staff, the Junior College System staff, the Higher Education Coordinating Commission staff, as well as several Vice-Presidents of the University of Minnesota.*

(5) Presentations describing the project were presented to: The Minnesota Department of Education, personnel from several school districts, representatives of the Educational Research Development Lab, The University of Wisconsin, The University of New York (Stoney Brook), The University of Colorado, WICHE-MIS, Administrative Vice-Presidents of the State Colleges, and The State College Information Systems Advisory Group.*

2.6 Compatible Planning Tools

No effort was expended on this objective.

2.7 Program Analysis and Faculty Activities

A significant percentage of the project resources were expended on two Ph.D. dissertations. These are available as Project PRIME Reports Nos. 6 and 10. Enclosures B and C are a brief summary of each study. The project team feels that participation in a project is an ideal way to write a dissertation, and should be encouraged by the Higher Education Coordinating Commission.

2.8 Linking CAMPUS to Institutional Information Systems

Little effort was planned on this objective, although the project team believes that this is one of the highest priority areas requiring future research and work. Project PRIME No. 7 does address the problem in the context of a "Faculty Activity System."

2.9 Problem Areas Requiring Future Research

These are explored in section 5.

2.10 Detailed Input Documentation

The documentation received from the Ford Foundation Project at Toronto was incomplete. Three categories of documentation were added: (1) A user input manual - available as Project PRIME Report No. 12; (2) Technical documentation - primarily comments in the computer code; and (3) User experimentation manual - documentation on how administrators can use the model is available as Project PRIME Report No. 9.

*Enclosure E contains the agendas for selected presentations made by the project team.

2.11 Additional Organizations

Macalester College, after expressing interest in participating in the project, withdrew in anticipation of having more adequate resources to implement the model at a later date. Hopkins School District was included because two of the project staff did the study as a course project in education administration (with the help from a HECC staff member). The Division of Educational Psychology (EP) was added at the urging of the Division head. Although given little support from the project team, the EP base data was simulated for one year and apparently "replicated" the 1969-70 budget. Other efforts at the EP involved developing plans to add the Educational Administration Division, estimating the costs of doing the College of Education, and writing an excellent study on the implementation. (See Project PRIME Report No. 15.)

2.12 Model Improvements

Several changes were made to the model during the project. These involved:

(1) Improvements to the existing reports; e.g., correcting errors and rounding problems;

(2) Additions to the existing reports - one was added to describe the relationship between degree-curricula-course;

(3) Modification to the student flow model to improve the handling of student transitions;

(4) Development of a sub-program concept and code. Basically sub-programs are "minors" (in addition to the present degree-major orientation found in CAMPUS); and were added to improve the "precision" of determining what courses are being taken by students.

2.13 Program Costing Module

The descriptive material from the University of Toronto on the CAMPUS model indicated that the computer code was capable of computing costs both for programs and cost centers. However, the computer code which was released was incapable of computing program costs. The only reports available were "cost center" oriented.

In order to convert input-oriented department data into output-oriented program data, the project team designed a "program costing module."* The reports available from the program costing module enable an administrator to develop and analyze, in considerable detail, his "program budget."

Four processes are used by the module to handle the conversion:

(1) Service Department Process: A set of procedures to handle the Staff, Space and Equipment.

*Described in Project PRIME Report No. 5.

(2) Activity/Curriculum Process: A conversion routine to handle the six types of "direct cost" resources - (a) Academic Staff; (b) Academic Support Staff; (c) Classroom maintenance cost; (d) Lab space maintenance cost; (e) Special Lab Space maintenance and equipment operating costs; and (f) Teaching Equipment cost.

(3) Non-Teaching Duty Process: A set of rules for converting faculty non-teaching duties to program elements.

(4) Academic Indirect Resources Process: An allocation technique for three types of "academic" indirect resources; non-academic support (e.g., secretaries); miscellaneous resources (e.g., supplies); and office space maintenance cost.

The individual application of these four processes to the CAMPUS V model results in a series of program-oriented reports. If all four processes are applied, a series of summary reports (7.1-7.3) are available. A sample format for each of the available program reports can be found in Project PRIME Report No. 10. Enclosure D describes each program costing report.

For each program element, it is possible to receive many of the above reports for ten years, by quarter. Typically, a manager would not want to look at this number of reports. To redress this situation, a series of "program" overtime reports were developed.* These reports summarize various operating costs, by year, for a ten-year period, in a program format.

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*Recall that the present CAMPUS V model has "cost center" overtime reports.

3.0 PROJECT REPORTS

Enclosure A is an annotated list of the reports prepared by the project. Depending on the interest of the reader, several combinations of reports are relevant:

POTENTIAL USER OF CAMPUS: Reports 2, 15 and 16.

INTERESTED IN PROJECT PRIME: Reports 1, 2, 14 and 16.

USER OF CAMPUS: Reports 8 and 12.

PPB SYSTEMS IN HIGHER EDUCATION: Reports 3, 4 and 10.

FACULTY ACTIVITY ANALYSIS: Reports 6 and 7.

RESOURCE ANALYSIS & MODELLING: Reports 5, 8, 10 and 13.

EXPERIMENTATION WITH CAMPUS: Reports 9 and 10.

4.0 CONCLUSIONS

This section includes various comments and conclusions reached during the project. The next section (5.0) will present recommendations.

4.1 Conclusion-Computer Program

There are basically three problems in the existing CAMPUS computer coding -

(1) Excessive run time;

(2) Restrictions on institution size that can be handled;

(3) Limited reporting capability.

The CAMPUS computer code was written by several people over a period of six years. Because of this, the resultant computer program is a "patchwork" of individual programs. The patchwork contributes to the fact that, although the project team ran the model successfully approximately 50 times, there were still situations when it was difficult to get the program to execute (oftentimes, however, we found data errors). The "patchwork" also contributed to a lengthy running time, and the corresponding expense. Although difficult to estimate, the running cost is primarily a function of: (1) the number of years in the simulation; (2) the number of cost centers; and (3) the number of reports. For the Business School version, which had ten cost centers, a ten-year simulation cost approximately $150.*

The second negative aspect of the CAMPUS computer program is the restricted size of institution that can be handled. The restriction results from two factors: (1) the level of detail (e.g., "course" level) accommodated in the model, and (2) the "core dependent" approach taken in programming (e.g., all input data available to the model is stored in memory before the beginning of each simulation). Important restrictions include:

(1) 25 cost centers: Only institutions with 25 or less departments (including support);

(2) 80 programs: Including both degrees and support programs;

(3) 1000 courses;

(4) 32 courses: per quarter, per degree;

(5) 200 curriculum - a group of courses by quarter by degree contribute a curriculum. If all degrees in an institution on a quarter system are four years and each cirriculum is unique, only 16 degrees can be run.

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*Based on charges at the University of Minnesota's CDC 6600 as follows:
Central Processor time = $12.50 per minute
Peripheral Processor = $1.25 per minute
Paper = $.02 per page

A third negative aspect of the CAMPUS computer program is the unavailability of certain reports, including:

(1) Program Oriented Reports - The addition of the program costing module and its 27 report formats has improved this situation; and

(2) Academic Year Reports - All of the CAMPUS cost center reports are for a simulation period (quarter or semesters); there are no annual reports.

4.2 Conclusions - The Conceptual Model

Three things make CAMPUS unique among the existing University Planning Models:* (1) The course-level detail; (2) Student flow capability; and (3) the fact that it is operational.

The CAMPUS model provides predictions based upon resource information at the course level of detail. Also, student credits, student contact hours, etc. are built up at the course level. This can be both a plus and a minus. It is a minus because it requires a significant amount of data collection; and also because it does create additional detailed data for the user - much of which he may not want or need. However, the additional data is a plus because if resource data is available, it is usually available in this form. Also, the course level detail tends to make the resource prediction more accurate.

The second unique factor in the CAMPUS model is its internal capability to flow students.** CAMPUS accepts "freshmen" (first year students) and flows them through the system - from freshmen to sophomores to juniors to seniors to graduation - automatically. CAMPUS does not predict how many students will be available in 1975 to enter the system, but it will predict how many freshmen who enter in 1975 will graduate in 1979. Again, the student flow model has positive and negative aspects. Negative - the student flow model contributes greatly to the "downtime" problem mentioned previously and also to the expense. Also from a conceptual view, the existing flow model could be improved. In fact, the project team made several changes to the student flow routine. Despite these negative comments, the student flow routine in CAMPUS is its greatest strength. Without it, the model would not be able to simulate the impact (through time) of various alternatives.

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*Project PRIME 10 reviews approximately 50 University Planning models.

**Project PRIME Report No. 8 describes the student flow process in CAMPUS.

4.3 Conclusions - The Availability of Data

CAMPUS requires a significant amount of data. For any operational use of CAMPUS, it is imperative that the institution's data base be capable of supplying the needed input. Although the requirements for data are stringent there is only one type of data not readily available in most institution's data bases: The difficult datum is termed the "participation rate." The participation rate is the probability that each student in a degree major, in a particular quarter, in a particular credit range (freshmen, sophomores, etc.) will select a certain course. Perhaps an example will aid the reader's understanding.

Enclosure F is a CAMPUS Input Data Report 3.1. The last column is labelled "participation rate." Using the first participation rate as an example (75%), we note that it is for credit year 1, simulation period 1, program curriculum No. 160, and Activity Number Code 159. In other words, this indicates that course No. 159, offered in fall quarter 1969-70, has a 75% probability of being taken by a first year MBA student. We note that there are 78 "participation rates" for the MBA degree. Most institutional data bases do not keep participation rates; however, the basic data is available but not kept in a "machine-readable" form.

Particularly relevant for the Minnesota higher education system is the third unique characteristic of CAMPUS - it is operational.

In summary, it is the project team's opinion that, despite any limitations of the computer code, the concept of the CAMPUS model (i.e., course level detail and student flow capacity) is excellent. Although noted above that most of the data are readily available, we did not say "easily available." Most of the institutional data bases and reporting capabilities would have to be modified to utilize the CAMPUS model in a meaningful operational way.*

4.4 Conclusions - Value of A Simulation Model

It is difficult to be definite because of the test implementation nature of the study; however, utilizing the CAMPUS model appears to be valuable in several ways. First, it tends to structure the thinking of people searching for data to be included in a data base. Alternatively stated, CAMPUS provides a good structure for a Management Information System.

A second valuable feature of the CAMPUS model is that, once a set of data has been collected, it makes the generation of alternatives extremely easy and inexpensive (recall the various alternative configurations of the Business School described above). The ability to easily generate alternatives should greatly improve analysis.

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*The next section will discuss changes needed to the various institutional data bases in Minnesota.

The ability to "model" meaningfully the institution is a third valuable feature of CAMPUS. Basically the model gives analysts and managers a common "language" to describe the institution. Words like "programs" and "curriculum" are quantified and have meaning.

The fourth valuable characteristic of the model is that it can be useful for an analyst in generating a "plan," but still maintains enough detail to indicate the "budget" impact. In other words, "program budgeting" is a meaningful word with the availability of the CAMPUS model. In fact, certain reports from the model are program budgets for a quarter, for an academic year and for ten academic years by year (enclosure D included sample "program budget" reports).

The fifth valuable asset of the CAMPUS model is that it represents an effective way to begin program budgeting in Minnesota. We have added the "ing" to indicate that program budgeting is a management process, whereas a program budget is just one tool in the process. Other tools include a "calendar of events," program memoranda, and a commitment to analysis (particularly cost-benefit analysis).*

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*Project PRIME Reports 4 and 10 describe these and other tools associated with program budgeting systems.

5.0 RECOMMENDATIONS

This section includes recommendations for future action as it relates to the work of Project PRIME. Many of the items that would have been recommendations two months ago are now in process (e.g., the work by Bemidji State College with a "follow-on" proposal to study their "data base" and how it can be modified to utilize CAMPUS).

5.1 Recommendations on the Model

As noted previously, the CAMPUS V is an expensive, restrictive model with little flexibility in its reporting ability. In order to improve these factors, we felt that the model should be completely rewritten, including the program costing module. Two comments are germane: First, the rewriting is necessary to handle the larger institutions in the state and to reduce the cost. Second, the project team considers CAMPUS VI (available from the Systems Research Group in Toronto) as a good alternative to this rewriting, however, CAMPUS VI has two drawbacks - expense and availability on only IBM equipment. A detailed analysis comparing these two approaches is necessary.

One aspect of the recommendation above is that it assumes that rewriting CAMPUS V or purchasing CAMPUS VI is a better apporach than using any other available comprehensive model. Second, the recommendation also assumes that a model is desirable and valuable in Minnesota higher education and that a CAMPUS-type model is the best approach.

5.2 Recommendations on a Planning, Programming and Budgeting System (PPBS) for Minnesota Higher Education

The original project proposal (PRIME Report No. 1) indicated that the "problem" we were addressing was "to link planning, budgeting, and operations" in Minnesota higher education. Hopefully, this "linking" would improve the resource allocation process. Test implementing CAMPUS was only a first step, albeit an important first step, in establishing a PPBS.

Why does Minnesota higher education need a PPB system? Without exploring all the reasons, several are immediately apparent:* (1) The Minnesota Legislature wants a coordinated state-wide planning function; (2) Program review is facilitated by a PPB system; (3) The cry for accountability from various publics, including students, legislators, taxpayers; (4) Rational planning and analysis for new institutions; and (5) Interest expressed by individual institutions to begin implementation (e.g., Announcement by the University of a pilot, "program budget" project).

Despite the apparent advantages, no state planning body or any individual institution has a completely operating PPB system. Why do we think that Minnesota has a chance? Our optimism is primarily based on the following factors: (1) Access to the CAMPUS model-converted to

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*Project PRIME Report No. 4 gives seven advantages of a PPBS.

run on the University's computer; (2) Experience gained from test implementing the CAMPUS model; (3) Availability of trained, top-rate personnel; (4) Commitment and interest from several administrators in various positions; and (5) Likelihood of adequate funding to complete the project.

The project team believes that the Higher Education Coordinating Commission should take the lead in a state-wide effort to implement a PPBS. However, considerable thinking is needed on specifying: (1) exactly what aspects of PPB are relevant for the Minnesota higher education system; (2) how can implementation be facilitated by the use of planning models like CAMPUS; and (3) who does what for a state-wide higher education PPB system?

Specific tasks involve: (1) determining an appropriate "calendar," so that the "program budget" will be available for presenting the higher education budget to the Legislature; (2) considering the problems of relating the individual institution's PPBS to a state-wide system; (3) working with NCHEMS and various staffs (particularly HECC, SCS, JCS) on appropriate output indicators to be used in the PPB cycle; and (4) coordinating the education system with the State Department of Administration System; and (5) establishing an advisory body and other administration structures to oversee and accomplish the implementation.

5.3 Recommendations on the Institutions

The recommendations contained in 5.1 and 5.2 have a significant impact on two important aspects of each of the institutions of higher education in the state - their information/decision structure and their people. Using a model, within an explicit management process like a PPBS, is a different resource allocation procedure than the traditional budget process. This change, in order to be effective, requires understanding and acceptance by the participants. In order to gain this understanding and acceptance, two things are needed - time and training. Personnel responsible for implementing a PPBS must realize that: "the hopes and aspirations of program budgeting are not tied to a solution of today's problems tomorrow, but rather to a pattern of continuous and timely response to the diverse problems and environmental changes relentlessly facing most organizations. Thus, the major benefits of program budgeting involve the willingness of a decision maker to commit resources now for benefits that may not come about for a number of years."*

PPBS is not a "thing" that can be implemented and then forgotten; it is a philosophy, an approach to management - a management process. Therefore, the project team recommends a program of continual training on the concepts and ideas associated with a PPBS. Several levels of training are desirable:

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*Benton, J. B. and Tenzer, A. O. Program Budgeting and Executive Commitment, the RAND Corporation, P4143 July 1969, 37 pp.

(1) The data base manager: Managers operating with a PPBS require a significant amount of data - since open, explicit, verifiable analysis of alternatives is the essence of a PPBS; training on techniques and procedures for collecting, retrieving and maintaining this data is required.

(2) The planner/analyst: The data base for a PPBS is the "approved plan." A PPBS utilizing the CAMPUS model would have a CAMPUS "tape" as a significant part of the approved plan.* The mission of the planning-analysis staff is to improve and update this plan. Basically this is done by cost-benefit analysis of alternative programs that could be included in the "plan." Training is needed on how to do cost-benefit analysis of higher education programs.

(3) The manager-user: Analysis that does not have an impact on the actions of administration soon does not get done. A PPBS encourages, and in fact requires, analysis. However, administrators must be trained to ask meaningful questions and to understand the role of analysis and analysts in decision making.

Although continual training is important, a second recommendation by the project team is that a thorough study be made of the relationship between the CAMPUS input requirements and the existing institutional data base. Bemidji State College and the State College Board have already prepared a project to do such a study. A similar study is particularly relevant in the Junior College System because of their conversion to a "third generation" computer. The conversion represents a unique opportunity to insure that the junior college information system is developed with compatibility and flexibility to (1) participate in NCHEMS at WICHE, (2) satisfy various government reporting (HEGIS), (3) utilize resource allocation models like those being tested by PRIME, and (4) meet the reporting needs at the central office.

The University of Minnesota's attempt at "zero-base budgeting" also would appear to require a similar study.

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*Since CAMPUS requires assumptions about course offerings, student flow, faculty activities, organizational structures, degree requirements, etc., it is definitely a plan. Project PRIME 10 further explains this concept.

6.0 INTERMEDIATE CONTINUATION

The Commission (HECC) staff has been quite supportive of the CAMPUS efforts and encourage experimentation and implementation of it by institutions and system within Minnesota.

As an interim measure, the budget on this project was controlled so that sufficient funds would be available for institutions to run the model for one more year. This involves a part-time computer programmer/analyst who is sufficiently familiar with the model to make runs for an institution and make any changes in the model necessitated by computer center system changes. A small account is also available for supplies and computer time. Any extensive runs will require additional funds and/or a computer center grant.

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Campus Instruction Process, University of Minnesota, School of Business, Session 1969-70

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ENCLOSURE A

ENCLOSURE A
Project PRIME Reports
Annotated Bibliography

Report Number	Title	Author	Annotation
1.	Test Implementation of CAMPUS (A Computer Based Simulation Model) for Higher Education Administration and Planning in Minnesota, March 1970, 59 pp.	Andrew, Cordes, Lorents	Initial proposal.
2.	An Introduction to Project PRIME and CAMPUS-MINNESOTA, November 17, 1970, 31 pp.	Cordes	Describes in general CAMPUS inputs, processes and outputs Also provides overview of Project PRIME and research in progress.
3.	PPBS in Higher Education: An Annotated Bibliography, May 1971, 248 pp.	Cordes	Includes 325 annotated references, 100 carefully selected annotated references from other sources, 50 author's abstracts, 50 related bibliographies, and approximately 1,000 non-annotated references.
4.	PPBS in Education: Concept, Operation, Status, and a School of Business Administration Example, March 1970, 61 pp.	Cordes	Establishes six conceptual processes to describe PPB systems. Using these six processes as a framework, the Department of Defense's PPB system is then described in detail. After discussing the status of PPB in higher education, an approach to applying the system at a School of Business is explored.
5.	Program Costing with the CAMPUS Simulation Model, June 1971, 31 pp.	Cordes	Program costing is the conversion of input-oriented budget data into output-oriented program data. The paper describes the philosophy of program costing, the mechanics of conversion, and the resulting reports. A comparison of a course-oriented and a degree-oriented program structure is also presented (should be read in conjunction with PRIME Report No. 8).

Report Number	Title	Author	Annotation
6.	Faculty Activity Analysis and Planning Models in Higher Education, June 1971, 341 pp.	Lorents	A Ph. D. dissertation describing the use of a random alarm mechanism for a self-work sampling study of the University of Minnesota's School of Business Administration faculty.
7.	A Faculty Activity Information Subsystem and CAMPUS-MINNESOTA, June 1971, 13 pp.	Lorents	Describes a sample data base that could be used to generate the staff inputs for the CAMPUS model.
8.	Operational Overview of the CAMPUS Simulation Model, June 1971, 48 pp.	Cordes	Describes the inputs, process and outputs of the CAMPUS model. The process includes: (1) An instructional process that "forces" the user to define his degree-curriculum-course relationship; (2) A student flow process for transferring students from academic year to academic year (e.g., freshmen to sophomore); (3) A non-teaching duty process that calculates individual faculty activities (e.g., departmental research); (4) A service department process that enables the user to replicate the support and research activities that are accomplished by specific organizations; and (5) A miscellaneous resource process for handling the remaining "line items" found in traditional budgeting (e.g., supplies, benefits, travel expenses).
9.	Using a Planning Model in Higher Education, (in progress).	Fisher	Depicts how a planning model can be used within the management process of a School of Business Administration Also includes five case studies of experiments run at the school.

Report Number	Title	Author	Annotation
10.	Resource Analysis Models in Higher Education: a Synthesis (in progress).	Cordes	A Ph. D. dissertation describing an approach to resource analysis for higher education. First, an integrated management framework is developed primarily based on the ideas associated with Planning, Programming and Budgeting Systems (see PRIME 4). Within this framework, the author presents a scheme for doing resource analysis based on three models: (1) CAMPUS; (2) Program Costing and (3) Input-output (each of these models are described in other PRIME reports). Three representative problems are also presented: (1) Limiting admissions for an undergraduate program; (2) Establishing one master's level degree, instead of the present three degrees; and (3) Reorganizing from a departmental organization with six academic departments and three research centers to a program organization with four research centers.
11.	Converting CAMPUS V to CAMPUS-MINNESOTA (in progress).	Davitt	Describes the process of converting CAMPUS V from an IBM 360-85 to a CDC 6600.
12.	CAMPUS-MINNESOTA User Information Manual, June 1971	Andrew	The report is designed to aid the user in four specific areas: (1) The conceptual modeling of the institution; (2) The preparation of machine readable input data; (3) The preparation of simulation and report commands for the model; (4) The actual running of the program on a CDC 6600 computer. Copies of the 75 input formats are included.
13.	Applying Input/Output Analysis and the ELFYD Model to Higher Education, (in progress).	Cordes	Describes the use of input/output analysis in higher education. The application represents the third model in the resource analysis scheme described in PRIME 10. PRIME 8 and 5 should be read prior to reading this report.

Report Number	Title	Author	Annotation
14.	Mid-Year Progress Report, January 1971, 10 pp.	Andrew, Cordes, Lorents	Includes a description of progress on the six original project objectives. Four additional goals that were added to the project are also described. Detailed financial information on the project is also included.
15.	Case Studies of Resource Simulation in Education (A High School; A Junior College; A State College and Two Schools of a Large University) (in progress).	Cordes (Editor)	Each case study is written by an individual within the institution where the test implementation was attempted. Included are descriptions of data collection problems, usefulness of model, and overall impressions of the test implementation.
16.	Final Report of Project PRIME, October 1971.	Andrew, Cordes, Lorents	Includes (1) a summary of the project, and (2) conclusions and recommendations about using CAMPUS in Minnesota education.

ENCLOSURE B

ENCLOSURE B

Summary of the Study

"Faculty Activity Analysis and Planning Models in Higher Education"

THE PROBLEMS: Chapter I discussed the problems higher education is facing. These problems include dynamic student growth rates, rising costs, program expansion, increasing complexity of the systems and a growing dissatisfaction with the outputs. The growth of students from 1940 to 1960 was 2 million students, an increase of 133 per cent. Student enrollments are estimated to climb to 10.3 million in 1980, an increase of 194 per cent over the 1960 enrollment of 3.5 million.

Increasing costs during this same period have compounded the problem. The cost per student index rose 55 points during the ten-year period from 1955 to 1967, while the consumer price index rose less than 20 points. The combination of these two factors, numbers of students and cost per student both climbing rapidly have put higher education into a crisis situation.

Other factors are also adding to the problem. Proliferation of specialized programs to meet the needs of growing problems in our society are adding to the costs. Many of these programs have high start up costs and low numbers of enrollees. Consequently, the cost per student is high. Coordinating bodies are attempting to control these programs to eliminate duplication within reasonable limits.

Probably one of the biggest factors adding to the overall problem is the increasing complexity of higher education systems. Universities have become

very complex systems. There are hundreds of subsystems and hundreds of interfaces that make up the system. Coupled with this there is a complex form of management (i.e., president, vice presidents, deans, department heads, committees, and faculty) that is involved in the process of distributing resources. This structure is complex because of the number of people, objectives and sub-objectives involved. In order to contend with these systems, universities must look toward more sophisticated management tools. Systems analysis, information systems, planning, programming, budgeting systems, and simulation are techniques that can help define and structure the university system so that it can be managed and controlled. These techniques will aid in defining the relationships between inputs and outputs of the system, so that university management can make decisions regarding resource allocation that will produce outputs compatible to the objectives and goals of the institution. Aggregate costs of inputs will be broken down and associated with outputs so that decision making can proceed on the basis of cost per output as well as cost per input.

THE IMPORTANCE OF FACULTY ACTIVITY ANALYSIS: Implementing systems to aid the decision making process in higher education requires that data be collected, maintained and transformed so it can support the decisions that are to be made. Data on how faculty time is allocated to the various programs and processes of higher education represents the key factor. Over 80 per cent of the resources used in the primary academic areas are in support of faculty and staff activities. Consequently, decisions on alternatives depend a lot on how it affects the draw on faculty resources. Analysis on faculty activities is currently done in many forms across the country. Most studies use surveys where the faculty estimate the amount of time they feel they spend on various activities. There are many problems with these studies.

1. Activity Definitions
2. Measures of Faculty Activities
3. Population Problems
4. Acceptance by the Faculty
5. Accuracy of Data Collection Methods

This study is concerned primarily with the last problem. There is a general concensus among faculty and administrators that the estimating done is not accurate enough to be useful for planning models and systems to support the decision making process in higher education. The purpose of this study was to explore a self-sampling method of collecting data on faculty and determine if there are significant differences between the data collected via sampling and the data collected via estimating. Another purpose of the study was to assess the feasibility of using self-sampling as a method of collecting data.

BACKGROUND OF THE STUDY

The study was conducted as a part of Project PRIME (Planning Resources in Higher Education). Project PRIME was a one-year project to test implement the CAMPUS simulation model in three institutions of higher education in Minnesota. Parameters relating faculty time to activities are key variables in the CAMPUS model. Consequently, Project PRIME provided a unique environment to integrate a study on data collection relating to faculty activities.

THE STUDY

Thirty-four faculty from the School of Business at the University of Minnesota participated in the study. They were asked to complete five tasks as a part of the study.

1. Estimate at the beginning of the quarter the time they thought they would spend on each activity throughout the quarter (Pre-Estimates).
2. Sample their time over a period of the quarter (Experiment Data). Ten faculty sampled all 12 weeks, four faculty sampled the first six weeks, four faculty sampled the last six weeks, and 16 faculty sampled four at a time for three weeks covering the entire quarter.
3. Estimate at the end of the period the time they spent on each activity over the period sampled (Period Estimates).
4. Estimate at the end of the quarter the time they spent on each activity over the entire quarter (Post Estimates).
5. Complete a survey pertaining to their reactions on using self-sampling.

The sampling study was conducted using a random signaler device that would "beep" at random times during the day. The faculty member carrying the device recorded what he was doing at the time of the beep. The total time that the faculty member sampled during any sampling segment was distributed into the categories proportional to the number of points in each category. Time spent on faculty activities not sampled was accounted for by logging the hours into each category.

ENCLOSURE C

ENCLOSURE C

Summary of the Study

"Resource Analysis Modeling
in Higher Education
A Synthesis"*

The study's objective was to describe an approach to resource analysis within the framework of an integrated management system. The proposed management system was primarily based on an interpretation and expansion of the literature associated with Planning, Programming, and Budgeting Systems. Six interrelated conceptual processes were described: (1) a structuring process to develop a program structure; (2) an analyzing process to determine the resources required and the benefits received from various alternative programs; (3) an informing process to insure that participants in the management system receive information appropriate for their role; (4) an administrating process to "cement" the other processes by providing the procedures and forms for insuring that: analysis is surfaced for review, debate, and decision; the data base is maintained and modified to reflect decisions made, and the decisions are communicated, to all concerned personnel; (5) an operating process to insure efficient transformation of input into output; and (6) a controlling process to evaluate conformance of the operating process to plan.

A description of the tools and techniques used in each of the six processes for an operational system, the Department of Defense, was provided. These tools and techniques then formed a basis for designing a management system for a School of Business Administration.

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*The complete study is available as Project PRIME Report No. 10.

Within the framework of the proposed management system, the study concentrated on the analyzing process, and more specifically on the resource analysis portion. A theoretical synthesis for doing resource analysis in higher education was proposed utilizing: (1) the data structuring ideas associated with PPBS' structuring process; (2) the simulation and data manipulation capabilities of the CAMPUS V model; (3) a program costing module; and (4) the concepts of Input-Output Analysis.

The program costing module was designed using three assumptions about the resulting program structure: maintenance of organizational identity; preservation of an ability to parametrically reconstruct all resources; and restriction of allocation to that which is "generally accepted." These assumptions were necessary to allow conversion of a medium range program (i.e., a five-year program) into a short range plan (i.e., a budget).

The output from the program costing module is a series of program elements - both primary and support. In order to utilize these program elements in analysis, it is often necessary to do additional allocations. To facilitate this allocation a framework based on Input-Output Analysis was proposed. A computer program, ELFYD, was used to handle the required calculations.

The theoretical synthesis was then tested on three representative problems at a School of Business Administration - a limiting of admissions; a restructuring of degree offerings; and a reorganizing of the administrative structure. For each representative problem, reports were presented from four perspectives: (1) a budgetary/department orientation (CAMPUS V outputs); (2) a program orientation, including both primary and support programs (outputs from program costing module); and (3) a primary program orientation (outputs from ELFYD I/O model); and (4) a unit output orientation.

ENCLOSURE D

EXPER-MENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

COST CENTER
LEVEL 3 SCHO
AFFILIATED WITH

NODE 6 FINANCE/INS
3 INSTRUCTION

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 1.1
SESSION 1969/70
SIMULATION PERIOD 1

DIRECT COST BY ACTIVITY
(DOLLARS)

ACTIVITY NO.	NAME	REGIS CODE	LEV	SECTIONS NO.	ENROL-MENT	AVG. SIZE	PART	STAFF FULL	GENL	SUPRT.	EQUIPMENT(1) TEACH	SP LAB	SPACE(2) CLASS	LABS	SP LAB	ACTY TOTAL	COST PER (4)	COST PER (5)	COST PER (6)
55	3000		3	7	139	20	0	0	0	0	0	0	0	0	0	0	0.00	0.00	0.00
56	3100		3	1	35	35	0	1164	0	0	6	0	5	0	0	1175	33.57	.47	11.19
58	3300		3	1	35	35	0	1164	0	0	6	0	5	0	0	1175	33.57	.47	11.19
60	3400		3	1	48	48	0	1164	0	0	6	0	8	0	0	1178	24.54	.34	8.18
62	3500		3	1	3	3	0	1164	0	0	6	0	3	0	0	1173	391.00	5.43	130.33
64	8000		5	1	24	24	0	1164	0	0	6	0	4	0	0	1174	48.92	.68	16.31
65	8100		5	2	58	29	0	2328	0	0	12	0	10	0	0	2350	40.52	.56	13.51
68	8300		5	1	8	8	0	1164	0	0	6	0	3	0	0	1173	146.62	2.04	48.87
77	8990		5	1	7	7	0	216	0	0	0	0	0	0	0	216	30.86	.64	10.29
78	8995		5	1	2	2	0	216	0	0	0	0	0	0	0	216	108.00	2.25	36.00
123	3100		3	2	232	116	0	2328	0	0	12	0	30	0	0	2370	10.22	.14	3.41
124	3200		3	1	48	48	0	1164	0	0	6	0	8	0	0	1178	24.54	.34	8.18
137	8100		5	3	65	22	0	3492	0	0	18	0	11	0	0	3521	54.17	.75	18.06
140	8200		5	1	5	5	0	1164	0	0	6	0	3	0	0	1173	234.60	3.26	78.20
273	3000		3	2	95	48	0	1164	0	0	6	0	8	0	0	1178	12.40	.34	N/A
323	PL B		8	33	33	1	0	1782	0	0	0	0	0	0	0	1782	54.00	4.50	N/A
329	DISS		8	7	7	1	0	378	0	0	0	0	0	0	0	378	54.00	4.50	6.00
335	EXAM		8	1	1	1	0	54	0	0	0	0	0	0	0	54	54.00	4.50	N/A
				67	845	12	0	21270	0	0	96	0	98	0	0	21464	25.40	.48	9.80
						(3)											(3)	(3)	(3)

(1) - OPERATING COST ONLY
(2) - MAINTENANCE COST ONLY
(3) - AVERAGE FOR THE COLUMN

(4) - ENROLLEE
(5) - STUDENT CONTACT HOUR
(6) - STUDENT CREDIT HOUR
N/A INDICATES VARIABLE CREDIT ACTIVITY

October 7, 1971

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 1.2
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

COST CENTER
LEVEL NODE
3 SCHO 6 FINANCE/INS
FFILIATED WITH 3 INSTRUCTION

DIRECT COST BY COURSE LEVEL
(DOLLARS)

COURSE LEVEL	TOTAL DIRECT COST	TOTAL ENROLLEES	COST PER ENROLLEE	COST PER STUDENT CREDIT HOUR	COST PER STUDENT CONTACT HOUR
1	0	0	0.00	0.00	0.00
2	0	0	0.00	0.00	0.00
3	9427	635	14.85	5.82	.29
4	0	0	0.00	0.00	0.00
5	12037	210	57.32	21.12	.97
9	0	0	0.00	0.00	0.00
	21464	845	25.40	9.80	.48
	=====	====	======	======	======
			(1)	(1)	(1)

(1) = AVERAGE FOR THE COST CENTER

COURSE LEVEL NUMBER
1 = PREPATORY
2 = LOWER DIVISION
3 = UPPER DIVISION
4 = COMBINATION OF UPPER DIVISION AND GRADUATE
5 = GRADUATE AND PROFESSIONAL
9 = OTHER

October 7, 1971

ENCLOSURE D

EXPERIMENT 1 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 1.3
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

SUMMARY REPORT
DIRECT COST BY COST CENTER

COST CENTER NUMBER	COST CENTER NAME	TOTAL DIRECT COST	TOTAL ENROLLEES	COST PER ENROLLEE	COST PER STUDENT CREDIT HOUR	COST PER STUDENT CONTACT HOUR
1	BUSINESS SCHOOL					
2	OUTSIDE SBA					
3	INSTRUCTION					
4	RESEARCH CENTERS					
5	ACCOUNTING					
6	FINANCE/INS	21464	845	25.40	9.80	.48
7	IND&L RELATIONS		798	23.75	11.30	.55
8	MGMT SCIENCE			6.08	3.67	.40
9	MGMT/TRANS				10.98	.46
10	MARKETING/BLAW				6.86	.39
						.75
		(1)	(1)	(2)	(2)	(2)

CONFIDENTIAL DATA

(1) - GRAND TOTALS
(2) - OVERALL AVERAGES

D4

October 7, 1971

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 1.4
SESSION 1969/70
SIMULATION PERIOD 1

SUMMARY REPORT
DIRECT COST BY COURSE LEVEL
FOR ALL COST CENTERS

COURSE LEVEL	TOTAL DIRECT COST	TOTAL ENROLEES	COST PER ENROLEE	COST PER STUDENT CREDIT HOUR	COST PER STUDENT CONTACT HOUR
1					
2					
3					
4					
5					
9					

CONFIDENTIAL DATA

	(1)	(1)	(2)	(2)	(2)

(1) = GRAND TOTALS
(2) = OVERALL AVERAGES

COURSE LEVEL NUMBER
1 = PREPATORY
2 = LOWER DIVISION
3 = UPPER DIVISION
4 = COMBINATION OF UPPER DIVISION AND GRADUATE
5 = GRADUATE AND PROFESSIONAL
9 = OTHER

October 7, 1971

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL 1 PROG
AFFILIATED WITH

NODE 11 BSB REGULAR
7 UNDER GRADUATE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 2.1
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 3

468020

DIRECT COST
PROGRAM / COST CENTER / ACTIVITY
(DOLLARS)

PARTIAL REPORT

COST CENTER 5 ACCOUNTING

ACTIVITY CALENDAR CODE	ACTIVITY NUMBER	CREDIT RANGE 1 / SIMULATION PERIOD 1	2 / 1	3 / 1	4 / 1	5 / 1	6 / 1	ROW TOTALS
1024	1	0	4687	0	0	0	0	4687
1025	2	0	599	0	0	0	0	599
1026	3	0	693	654	0	0	0	1347
3255	6	0	0	1037	0	0	0	1037
SUBTOTAL = COST CENTER 5		7673	7673	7673	7673	7673	7673	46038

COST CENTER 6 FINANCE/INS

ACTIVITY CALENDAR CODE	ACTIVITY NUMBER	CREDIT RANGE 1 / SIMULATION PERIOD 1	2 / 1	3 / 1	4 / 1	5 / 1	6 / 1	ROW TOTALS
3100	56	0	0	0	1074	0	0	1074
3300	58	0	0	0	1074	0	0	1074
3400	60	0	0	0	1178	0	0	1178
3100	123	0	0	1041	653	0	0	1694
3200	124	0	0	0	1178	0	0	1178
3000	273	0	0	843	0	0	0	843
SUBTOTAL = COST CENTER 6		7043	7043	7043	7043	7043	7043	42258

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL
PROG 11 BSB REGULAR
FILIATED WITH 7 UNDER GRADUATE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 2.2
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

DIRECT COST
PROGRAM / COST CENTER
(DOLLARS)

CREDIT RANGE	1	2	3	4	5	6	ROW
SIMULATION PERIOD	1	1	1	1	1	1	TOTALS

OST CENTER 5 ACCOUNTING
OST CENTER 6 FINANCE/INS
OST CENTER 7 IND&L RELATIONS
OST CENTER 8 MGMT SCIENCE
OST CENTER 9 MGMT/TRANS
OST CENTER 10 MARKETING/BLAW

OTAL PROG 11 BSB REGULAR

CONFIDENTIAL DATA

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 2.3
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

ENCLOSURE D

SUMMARY REPORT
DIRECT COST BY PROGRAM
(DOLLARS)

PARTIAL REPORT

CREDIT RANGE	1	2	3	4	5	6	ROW
SIMULATION PERIOD	1	1	1	1	1	1	TOTALS

PROGRAM 10 BSB ACCOUNTING
PROGRAM 11 BSB REGULAR
PROGRAM 12 AGRI BUSINESS
PROGRAM 13 MBA DAY
PROGRAM 14 MBA EVENING
PROGRAM 15 MA IR

TOTAL - ALL PROGRAMS

CONFIDENTIAL DATA

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL 1 PROG
AFFILIATED WITH NODE 13 MBA DAY 8 GRADUATE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 2.4
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

DIRECT COST
BY STUDENT LEVEL
(DOLLARS)

STUDENT LEVEL (CREDIT RANGE)	TOTAL DIRECT COST	TOTAL ENROLLEES	COST PER ENROLLEE	COST PER STUDENT CREDIT HOUR	COST PER STUDENT CONTACT HOUR
1			0.00	0.00	0.00
2					0.00
3					.85
4					.42
5					.43
9					.97
TOTALS					2.67 (1)

CONFIDENTIAL DATA

(1) - AVERAGE FOR THIS PROGRAM

STUDENT LEVEL NUMBER
1 = PREPATORY
2 = LOWER DIVISION
3 = UPPER DIVISION
4 = COMBINATION OF UPPER DIVISION AND GRADUATE
5 = GRADUATE AND PROFESSIONAL
9 = OTHER

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL / PROG / ILIATED WITH — NODE: 11 BSB REGULAR, 7 UNDER GRADUATE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 2.6
SESSION 1969/70
SIMULATION PERIOD 1

ENCLOSURE D

DIRECT COST BY BUDGET CATEGORY
(UNITS AS NOTED)

	ACADEMIC STAFF (1)	ACADEMIC STAFF (2)	ACADEMIC SUPRT STAFF (1)	ACADEMIC SUPRT STAFF (3)	TEACH EQUIP (1)	CLASSROOM SPACE (1)	CLASSROOM SPACE (4)	ALL LABS (1)	ALL LABS (4)	SP LABS EQUIP (1)	TOTALS (1)
COST CENTER 5 ACCOUNTING	7606.	0.	0.	0.	5.	62.	0.	0.	0.	0.	7673.
COST CENTER 6 FINANCE/INS	6955.	0.	0.	0.	36.	52.	0.	0.	0.	0.	7044.
COST CENTER 7 IND*L RELATIONS	5081.	0.	0.	0.	25.	37.	0.	0.	0.	0.	5143.
COST CENTER 8 MGMT SCIENCE	563.	0.	0.	0.	3.	8.	0.	0.	0.	0.	574.
COST CENTER 9 MGMT/TRANS	11358.	0.	0.	0.	42.	74.	0.	0.	0.	0.	11474.
COST CENTER 10 MARKETING/BLAW	6858.	0.	0.	0.	42.	58.	0.	0.	0.	0.	6959.
	38422.	0.	0.	0.	153.	291.	0.	0.	0.	0.	38866.

) = DOLLARS
) = STAFFING UNITS / WEEK
) = CONTACT HOURS / WEEK
) = SQUARE FEET

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 3.3
SESSION 1969/70
SIMULATION PERIOD 1

ENCLOSURE D

AFFILIATED ENROLLEES
PROGRAM SUMMARY
(ENROLLEES, CONTACT HOURS, CREDIT HOURS BY PROGRAM)

NO.	PROGRAM NAME	CONTACT HOURS	CREDIT HOURS	CREDIT RANGE 1	2	3	4	5	6	ROW TOTALS
				ENROLLEES						
9	OTHER COLL-UNDER			747	0	0	0	0	0	747
10	BSB ACCOUNTING			0	120	528	515	0	0	1163
11	BSB REGULAR			0	360	1411	1696	0	0	3467
12	AGRI BUSINESS			0	45	141	96	0	0	282
13	MBA DAY			415	240	0	0	0	0	655
14	MBA EVENING			57	100	145	0	0	0	302
15	MA IR			67	99	0	0	0	0	166
16	SPONSORED RES			0	0	0	0	0	0	0
17	DEPT RESEARCH			0	0	0	0	0	0	0
18	CESB			0	0	0	0	0	0	0
19	IRC			0	0	0	0	0	0	0
20	MISRC			0	0	0	0	0	0	0
21	SUMMER RESEARCH			0	0	0	0	0	0	0
22	DEPT RESEARCH			0	0	0	0	0	0	0
23	BUSINESS EDUC			0	0	0	0	0	0	0
24	BUREAU BUS RES			0	0	0	0	0	0	0
25	FAC PUBLIC SER			0	0	0	0	0	0	0
26	COMPUTER CENTER			0	0	0	0	0	0	0
27	IR LIBRARY			0	0	0	0	0	0	0
28	BUSINESS REF			0	0	0	0	0	0	0
29	DEPT ADMIN			0	0	0	0	0	0	0
30	PHD ACCOUNTING			8	20	13	0	0	0	41
31	PHD FINANCE			1	7	6	0	0	0	14
32	PHD IND RELATION			0	2	5	0	0	0	7
33	PHD MANAGEMENT			5	9	6	0	0	0	20
34	PHD MIS			8	10	3	0	0	0	21
35	PHD MARKETING			3	1	2	0	0	0	6
36	PHD PROD			0	0	3	0	0	0	3
37	PHD QUANITATIVE			0	0	2	0	0	0	2
38	PHD INSURANCE			0	0	2	0	0	0	2
39	PHD TRANS			1	1	2	0	0	0	4
40	MS ACCTING			20	30	0	0	0	0	50
41	MS FINANCE			13	31	0	0	0	0	44
42	MS IR			0	0	0	0	0	0	0
43	MS MGMT			15	40	0	0	0	0	55
44	MS MIS			30	46	0	0	0	0	76
45	MS MKTG			10	25	0	0	0	0	35
46	MS PROD			3	14	0	0	0	0	17
47	MS QA			13	22	0	0	0	0	35
48	MS INSURANCE			10	23	0	0	0	0	33

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 3.3
SESSION 1969/70
SIMULATION PERIOD 1

ENCLOSURE D

AFFILIATED ENROLLEES
PROGRAM SUMMARY
(ENROLLEES, CONTACT HOURS, CREDIT HOURS BY PROGRAM)

NO.	PROGRAM NAME	CONTACT HOURS	CREDIT HOURS	CREDIT RANGE 1	2	3	4	5	6	ROW TOTALS
				ENROLLEES						
49	MS TRANS			11	15	0	0	0	0	26
50				0	0	0	0	0	0	0
51				0	0	0	0	0	0	0
52				0	0	0	0	0	0	0
53				0	0	0	0	0	0	0
54				0	0	0	0	0	0	0
55				0	0	0	0	0	0	0
56				0	0	0	0	0	0	0
57				0	0	0	0	0	0	0
58				0	0	0	0	0	0	0
59				0	0	0	0	0	0	0
60	PRE BUS COUNSEL			0	0	0	0	0	0	0
61	GRAD STUDIES			0	0	0	0	0	0	0
62	PLACEMENT			0	0	0	0	0	0	0
63	COLLEGE ADMIN			0	0	0	0	0	0	0
64	ADMIN SERVICES			0	0	0	0	0	0	0
65	COMM COLL WIDE			0	0	0	0	0	0	0
66	OTHER COLL-GRAD			105	0	0	0	0	0	105
67	PROF DEVELOP			0	0	0	0	0	0	0
68	STU SUPPORT FAC			0	0	0	0	0	0	0
* TOTAL - ALL PROGRAMS ****				1542	1260	2269	2307	0	0	7378

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL 1 PROG
AFFILIATED WITH 20 MISRC
16 SPONSORED RES

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 4.1
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

SERVICE DEPARTMENT REPORT BY PROGRAM

11 MISRC

	CODE	TYPE OR RANK	NUMBER	TOTAL COST ($)	TOTAL SPACE REQUIRED SQ.FT	TOTAL MAINTENANCE COST ($)
STAFF						
	7	SEN SECY	1.00	1900	100	10
	5	SEC=Y	3.00	4500	300	30
	17	TEA ASST	8.00	12000	800	80
	20	RES ASST	4.00	7200	400	40
	21	ASST DIR	1.00	3000	100	10
SPACE						
	8	CONF			200	20
EQUIPMENT AND OTHER						
	4	CPT	1	1000		
	5	TERMINAL	1	1000		
TOTALS				30500	1900	190

TOTAL NUMBER OF SERVICE STAFF = 17.00
TOTAL SQ.FT OF SPACE REQUIRED = 1900
TOTAL PROGRAM COSTS = 30690

October 7, 1971

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 5.1
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SIMULATION PERIOD 1
PAGE 5

NON-TEACHING DUTIES---INDIVIDUAL FACULTY ACTIVITIES

NON-TEACHING DUTY NAME	DUTY CODE
STUDENT SUPPORT	5

PROGRAM NAME	ELEMENT CODE
STU SUPPORT FAC	68

COST-CENTER NAME	C-C NO.	STAFFING-UNITS REQUIRED	COST PER STAFFING UNIT	TOTAL COST
ACCOUNTING	5	18	70	1
FINANCE/INS	6	21	70	1
IND*L RELATIONS	7	29	70	2
MGMT SCIENCE	8	29	70	2
MGMT/TRANS	9	26	70	1
MARKETING/BLAW	10	39	70	2
TOTAL		162	70.00	9

ENCLOSURE D

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

PROGRAM REPORT 5.2
SESSION 1969/70
SIMULATION PERIOD 1
PAGE 1

EXCESS ACADEMIC STAFF TIME BY COST CENTER---SUMMARY

COST CENTER CODE	COST CENTER NAME	STAFFING UNITS	TOTAL COST
1	BUSINESS SCHOOL		
2	OUTSIDE SBA		
4	RESEARCH CENTERS		
5	ACCOUNTING		
6	FINANCE/INS		
7	IND≠L RELATIONS		
8	MGMT SCIENCE		
9	MGMT/TRANS		
10	MARKETING/BLAW		
	TOTAL		

48

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October 7, 1971

EXPERIMENT 0 BASE CASE 0 PERCENT STUDENT INCREASE

UNIV. OF MINN--SCH OF BUSINESS

ENCLOSURE D

PROGRAM REPORT 7.3
SESSION 1970/71
SIMULATION PERIOD 4
PAGE 1

TOTAL OPERATING COST - SUMMARY - ALL PROGRAMS

PROG NO.	CODE NAME	STAFF COSTS				EQUIPMENT COSTS			MAINT COST	MISC COST	TOTAL OPERATING
		ACAD	ACAD SPT	NON-ACAD SPT	SERVICE DEPT	TEACHING	SPEC LABS	SERVICE DEPT			
9	OTHER COLL-UNDER	[illegible]37.52	0.00	3253.06	0.00	21.76	0.00	0.00	152.66	4633.51	2[illegible]29[illegible].52
0	BSB ACCOUNTING		0.00	5276.01	0.00	88.34	0.00	0.00	206.27	7466.84	36397.23
1	BSB REGULAR		0.00	9909.39	0.00	153.81	0.00	0.00	426.38	14595.50	60177.23
2	AGRI BUSINESS			682.94	0.00	4.58	0.00	0.00	24.90	967.50	3145.47
3	MBA DAY			[illegible]3.34	0.00	125.63	0.00	0.00	183.27	6437.01	38658.71
4	MBA EVENING				0.00	39.55	0.00	0.00	75.86	3395.76	20446.55
5	MA IR				0.00	35.08	0.00	0.00	45.39	1878.61	11704.52
6	SPONSORED RES					0.00	0.00	0.00	0.00	0.00	0.00
7	DEPT RESEARCH					[illegible].00	0.00	0.00	220.38	19714.10	139224.52
8	CESB						0.00	0.00	70.00	0.00	7570.00
9	IRC						[illegible].00	0.00	290.00	0.00	40790.00
0	MISRC							2000.00	190.00	0.00	30690.00
1	SUMMER RESEARCH							[illegible].00	0.00	0.00	0.00
2	DEPT RESEARCH								0.00	0.00	0.00
3	BUSINESS EDUC								[illegible].00	0.00	1530.00
4	BUREAU BUS RES									0.00	3040.00
5	FAC PUBLIC SER									[illegible]16	81595.94
6	COMPUTER CENTER										20637.00
7	IR LIBRARY										[illegible]75.00
8	BUSINESS REF										
9	DEPT ADMIN										
0	PHD ACCOUNTING										
1	PHD FINANCE										
2	PHD IND RELATION										
3	PHD MANAGEMENT										
4	PHD MIS										
5	PHD MARKETING										
6	PHD PROD										
7	PHD QUANITATIVE										
8	PHD INSURANCE										
9	PHD TRANS	239.[illegible]									
0	MS ACCTING	3067.62									
1	MS FINANCE	2625.54	0.00								
2	MS IR	0.00	0.00								
3	MS MGMT	1897.00	0.00	291.[illegible]							
4	MS HIS	2807.25	0.00	518.12							
5	MS MKTG	1995.31	0.00	319.46	0.00						
6	MS PROD	986.94	0.00	162.37	0.00						
7	MS QA	1443.40	0.00	256.58	0.00	4.[illegible]					
8	MS INSURANCE	2455.63	0.00	351.91	0.00	9.52					
9	MS TRANS	3808.80	0.00	579.23	0.00	18.42	0.00				

CONFIDENTIAL DATA

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October 7, 1971

ENCLOSURE D

TOTAL OPERATING COST - SUMMARY - ALL PROGRAMS

PROG NO.	CODE NAME	STAFF COSTS: ACAD	ACAD SPT	NON-ACAD SPT	SERVICE DEPT	EQUIPMENT COSTS: TEACHING	SPEC LABS	SERVICE DEPT	MAINT COST	MISC COST	TOTAL OPERATING
00	EXCESS										
01											
02											
03											
04											
05		0.									
06		0.00									
07		0.00									
08		0.00			0.00						0
09		0.00	0.00		0.00						00
10	PRE BUS COUNSEL	0.00	0.00		8787.00						.00
11	GRAD STUDIES	0.00	0.00		6200.00						.00
12	PLACEMENT	0.00	0.00	0.	6150.00						0.00
13	COLLEGE ADMIN	0.00	0.00	0.00	22300.00						00.00
14	ADMIN SERVICES	0.00	0.00	0.00	10050.00						.50.00
15	COMM COLL WIDE	0.00	0.00	0.00	6150.00						.188.00
16	OTHER COLL-GRAD	3911.89	0.00	706.67	0.00						5669.56
17	PROF DEVELOP	24000.00	0.00	3859.40	0.00						33659.05
18	STU SUPPORT FAC	12000.00	0.00	3450.13	0.00						20623.94
TOTAL PROGRAM COST		489874.29	0.00	82210.06	167262.00	588.5.					859230.97

CONFIDENTIAL DATA

EXPERIMENT 5 BASE CASE 0 PERCENT STUDENT INCREASE

PROGRAM LEVEL PROG FILIATED WITH 11 BSB REGULAR 7 UNDER GRADUATE

NODE

UNIV. OF MINN--SCH OF BUSINESS

ENCLOSURE D

TOTAL OPERATING COST - BY PROGRAM

PROGRAM REPORT 5.3
SESSION 1969/70
SIMULATION PERIOD 30
PAGE 3

	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79
AFF COSTS										
ACAD STAFF	126399.	124353.	128446.	134383.						
CAD SPT STAFF	0.	0.	0.	0.						
ON-ACAD SPT STAFF	33760.	30887.	30247.	35944.						
ERVICE STAFF	0.	0.	0.	0.						
SUBTOTAL	160158.	155240.	158693.	170327.						
IPMENT COSTS										
TEACHING EQUIPMENT										
PECIAL LABS										
ERVICE DEPTS										
SUBTOTAL										
INTENANCE COST										
	.943.	2167.	2039.	2087.	2090.					
SCELLANEOUS COST										
	378.	75371.	70586.	73938.	73249.					
TOTAL	520.	325201.	310252.	316551.	323025.					

CONFIDENTIAL DATA

D18

October 7, 1971

ENCLOSURE E

ENCLOSURE E

Agenda for Selected Presentations

Information on CAMPUS activities and progress was given in presentations to participating institutions and agencies periodically throughout the project year. A list of participants and presentation dates is provided as follows:

1.	Staff of Minnesota Higher Education Coordinating Commission	January 22, 1971
2.	School of Business Administration, University of Minnesota	January 25, 1971
3.	Minnesota State College Board	February 16, 1971
4.	Minnesota State Junior College System	February 17, 1971
5.	Information Systems Advisory Committee, Minnesota State College System	March 9, 1971
6.	Administrative Staff, University of Minnesota	March 31, 1971
7.	Administrative Staff, University of Wisconsin and Representatives of Public School Districts	April 26, 1971
8.	State Department of Education	May 7, 1971
9.	Bemidji State College	June 28, 1971

The agenda for these presentations is attached.

ENCLOSURE E

Agenda
Presentation on CAMPUS-MINNESOTA
and Project PRIME

		Approx. Time
1.0	Background and History	5
	1.1 CAMPUS Development - University of Toronto/ Systems Research Group	
	1.2 Project PRIME	
2.0	Goals of PRIME	10
	2.1 Six Objectives	
	2.2 Schedule	
	2.3 Program Budget	
3.0	The CAMPUS Model	
	3.1 Inputs	5
	3.2 Process	10
	(a) Activity - Curriculum	
	(b) Service Department	
	(c) Non-Teaching Duties	
	3.3 Outputs	20
	(a) Three categories + 1 planned	
	(b) Sample Outputs	
4.0	Model Uses	5
5.0	The Future	5
		60 Minutes

ENCLOSURE F

ENCLOSURE F

Figure III-13
INPUT DATA REPORT 3.1
CAMPUS INSTRUCTION PROCESS
UNIV. OF MINN--SCH OF BUSINESS
SESSION 1969-70

INPUT DATA REPORT 3.1
SOURCE DOCUMENTS PROGRAM 01
PROGRAM 02
PROGRAM 03
PROGRAM 04
DEFINE 05

PROGRAM CURRICULA AND ACTIVITY PARTICIPATION

PROGRAM NODE	PROGRAM NAME	MAX. NO. YEARS-CREDITS	CREDIT YEARS	SIMULATION PERIOD	PROGRAM CURRICULUM NO. CODE	ACTIVITY NUMBER CODE	ACTIVITY CALENDAR CODE	ACTIVITY TYPE	PARTICIPATION RATE (%)
13	MBA DAY	2 27							
			1	1	160	159	B005	LECTURE1	75
						161	B005	LECTURE1	75
						40	B260	LECTURE1	20
						65	B100	LECTURE1	10
						33	B050	LECTURE1	35
						243	B151	LECTURE1	35
						156	B001	LECTURE1	30
						64	B000	LECTURE1	10
						204	B000	LECTURE1	35
						95	S032	LECTURE1	10
						302	PSY1	LECTURE1	10
						300	EC01	LECTURE1	10
						63	B153	LECTURE1	10
						137	B100	LECTURE1	30
						268	B154	LECTURE1	30
			1	2	162	162	B009	LECTURE1	75
						163	B010	LECTURE1	10
						262	3044	LECTURE1	10
						206	B047	LECTURE1	20
						65	B100	LECTURE1	20
						34	B051	LECTURE1	35
						244	B159	LECTURE1	35
						228	B150	LECTURE1	30
						95	S032	LECTURE1	10
						304	SOC1	LECTURE1	20
						301	EC02		20
						83	B154	LECTURE1	20

ENCLOSURE F

Figure III-13
INPUT DATA REPORT 3.1
CAMPUS INSTRUCTION PROCESS
UNIV. OF MINN--SCH OF BUSINESS
SESSION 1969-70

INPUT DATA REPORT 3.1
SOURCE DOCUMENTS PROGRAM 01
PROGRAM 02
PROGRAM 03
PROGRAM 04
DEFINE 05

PROGRAM CURRICULA AND ACTIVITY PARTICIPATION

PROGRAM NODE	PROGRAM NAME	MAX. NO. YEARS-CREDITS	CREDIT YEARS	SIMULATION PERIOD	PROGRAM CURRICULUM NO. CODE	ACTIVITY NUMBER CODE	ACTIVITY CALENDAR CODE	ACTIVITY TYPE	PARTICIPATION RATE (%)
						302	PSY1	LECTURE1	20
						300	EC01	LECTURE1	20
		1	3	164		252	B150	LECTURE1	75
						163	A010	LECTURE1	10
						224	5100	LECTURE1	20
						138	A101	LECTURE1	20
						262	3064	LECTURE1	20
						99	5012	LECTURE1	20
						95	5032	LECTURE1	20
						298	4414		20
						83	515A	LECTURE1	20
						64	A000	LECTURE1	25
						301	EC02		20
		2	1	161		322	PL 3	LECTURE3	10
						323	PL 3		10
						324	PL 3	LECTURE3	15
						325	PL 3		10
						326	PL 3	LECTURE3	40
						327	PL 3		15
						159	4005	LECTURE1	25
						161	4009	LECTURE1	25
						40	426A	LECTURE1	20
						65	A100	LECTURE1	10
						204	GD53		100
						204	GD53		100

ENCLOSURE F

Figure III-13
INPUT DATA REPORT 3.1
CAMPUS INSTRUCTION PROCESS
UNIV. OF MINN--SCH OF BUSINESS
SESSION 1969-70.

INPUT DATA REPORT 3.1
SOURCE DOCUMENTS PROGRAM 01
PROGRAM 02
PROGRAM 03
PROGRAM 04
DEFINE 05

PROGRAM CURRICULA AND ACTIVITY PARTICIPATION

PROGRAM NODE	PROGRAM NAME	MAX. NO. YEARS-CREDITS	CREDIT YEARS	SIMULATION PERIOD	PROGRAM CURRICULUM NO. CODE	ACTIVITY NUMBER CODE	ACTIVITY CALENDAR CODE	ACTIVITY TYPE	PARTICIPATION RATE (%)
			2	2	163	322	PL 3	LECTURE3	10
						323	PL 3		10
						324	PL 3	LECTURE3	15
						325	PL 3		10
						326	PL 3	LECTURE3	40
						327	PL 3		15
						162	8009	LECTURE1	25
						163	8010	LECTURE1	50
						262	3064	LECTURE1	10
						206	8047	LECTURE1	20
						65	8100	LECTURE1	10
						205	GDS3	LECTURE1	50
						285	GDS3	LECTURE1	50
			2	3	165	322	PL 3	LECTURE3	10
						323	PL 3		10
						324	PL 3	LECTURE3	15
						325	PL 3		10
						326	PL 3	LECTURE3	40
						327	PL 3		15
						252	8149	LECTURE1	25
						163	8010	LECTURE1	30
						226	5100	LECTURE1	10
						138	8101	LECTURE1	20
						262	3064	LECTURE1	10
						99	5012	LECTURE1	20
						206	GDS3		50

ENCLOSURE G

ENCLOSURE G

Report of Expenditures by Source of Funds 7/1/70 - 6/30/71

Project PRIME

ITEM	HECC	GOVERNOR'S COMPUTER COMMITTEE	UNIVERSITY OF MINNESOTA	STATE COLLEGE SYSTEM	JUNIOR COLLEGE SYSTEM	HILL FAMILY FOUNDATION	TOTAL
Director						$16,000.00	$ 16,000.00
Associate Director (1)		$13,200.00					13,200.00
Associate Director (2)		11,550.00					11,550.00
Program Analyst						8,796.00	8,796.00
Program Analyst						7,660.00	7,660.00
Program Analyst						5,702.00	5,702.00
Data Analyst		250.00				150.00	400.00
Data Analyst						1,169.56	1,169.56
Clerical	$ 1,982.88	3,965.76					5,948.64
Keypunching	2,155.95						2,155.95
Fringe Benefits						4,346.22	4,346.22
Travel	1,594.01						1,594.01
Office Space	2,587.31						2,587.31
Commun., Sup., Eqp. & Print.	7,907.47		$ 1,752.63				9,660.10
Computer			5,928.99				5,928.99
Tape Discs	255.00						255.00
At-Test Sites							
Admin. (1)			*				*
Admin. (2)				$ 7,000.00			7,000.00
Admin. (3)					$ 7,000.00		7,000.00
Data Anal. (1)			3,328.00				3,328.00
Data Anal. (2)				5,000.00			5,000.00
Data Anal. (3)					5,000.00		5,000.00
TOTAL EXPENDITURES	16,482.62	28,965.76	11,009.62	12,000.00	12,000.00	43,823.78	124,281.78
TOTAL RESOURCES BUDGETED	14,400.00	30,000.00	23,000.00	12,000.00	12,000.00	45,644.00	137,044.00
TOTAL UNEXPENDED RESOURCES	(2,082.62)	1,034.24	11,990.38			1,820.22	12,762.22

*See attachment.

ENCLOSURE G

Project PRIME 1970-71
Budget Attachment

Proposed Budget for 7/1/71 - 6/30/72 for Continued Computer Capability to Run CAMPUS-M

Analyst (1) (1/2 time student)	$ 3,442.08
Computer time (2)	500.00
Paper, tapes and other supplies	1,048.30
Total	$ 4,990.38 (3)

(1) Mr. Raymond Pinson has been retained and is available to institutions to run CAMPUS-M.

(2) Additional computer time may be needed if extensive running is required. Such time may be available through a Computing Center grant.

(3) These funds are in an account with School of Business Administration, University of Minnesota, and under the authority of Associate Dean C. Arthur Williams.